PROPOSED

PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT NO. 0737-01-CT
Application for Significant Modification No. 0737-02

Company: Maui Asphalt X-IV, LLC

Mailing Address: 92 Ting's Drive
Wailuku, Maui, Hawaii 96793

Facility: 225 TPH Portable Drum Mix Asphalt Plant

Location: Various Temporary Sites, State of Hawaii

Initial Location: Puunene Quarry, Puunene, Maui
UTM: 765,979 Meters East, 2,304,078 Meters North, Zone 4 (NAD 83)

SIC Code: 2951 (Asphalt Paving Mixtures and Blocks)

Responsible Official: Ms. Dyvette Fong
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Consultant: J. W. Morrow
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Equipment:

Facility Equipment			
Equipment	Manufacturer	Model No.	Serial No.
225 TPH Drum Mixer with 75.6 MMBtu/hr Burner (increase from 160 TPH)	ADM	EX8842	DM 1193-12
Baghouse	ADM	BHP585-9	BH 1193-12
100 ton Silo	ADM	SS100	SI 1073-10
560 kW Kohler Genset (910HP)	Detroit Diesel Engine	MTU12V2000	535000536
4 Compartment Cold Feed Bin	ADM	4CFB20	CFB 1073-10
Various Conveyors	ADM		
0.45 MMBtu/hr Twin Stack Hot Oil Heater (insignificant activity)	ADM	Unknown	ACT 1073-10

SN per Blake Shiiji email 1-26-2011, except DE

BACKGROUND

Maui Asphalt X-IV, LLC has submitted a significant modification application for the temporary covered source permit to increase operation to a 225 TPH portable drum mix asphalt plant with the existing 910 HP diesel engine (from 160 TPH). The dryer/mixer drum and baghouse will be replaced with larger units. LPG will be added as an alternate fuel for the dryer/mixer drum and hot oil heater. To control SOx emissions the drum mixer, diesel engine generator and hot oil heater will be fired on ultra-low sulfur diesel (ULSD, primary fuel) with a maximum sulfur content not to exceed 15 ppm by weight. LPG is a clean alternative fuel. A baghouse servicing the drum mixer will be used to control particulate emissions. The diesel engine meets EPA tier 1 emission standards

Operating limits of 3,000 hours per year will be maintained on a rolling twelve-month (12-month) basis.

Process
Raw materials include aggregate and liquid asphalt. Aggregate types are proportioned by calibrated belt feeders onto a common collecting belt which transports the combined material into the drum. Hot liquid asphalt is added to the aggregate in the drum. Resulting mix is 93-95% aggregate and 5-7% liquid asphalt.

The drum mixer is of the counter flow design where the gas stream moves in the opposite direction to the aggregate. The burner is located at the discharged end of the drum mixer and the heated gases are pulled through a knock-out box at the material inlet of the drum, before entering the baghouse. The captured aggregate dust is returned to the drum via pneumatic conveyor. The final product is conveyed via a drag conveyor to the holding silo for truck loud-out.

APPLICABLE REQUIREMENTS

Hawaii Administrative Rules (HAR)
Title 11 Chapter 59, Ambient Air Quality Standards
Title 11 Chapter 60.1, Air Pollution Control
- Subchapter 1, General Requirements
- Subchapter 2, General Prohibitions
  - 11-60.1-31, Applicability
  - 11-60.1-32, Visible Emissions
  - 11-60.1-33, Fugitive Dust
  - 11-60.1-38, Sulfur Oxides from Fuel Combustion
- Subchapter 5, Covered Sources
- Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
  - 11-60.1-111, Definitions
  - 11-60.1-112, General Fee Provisions for Covered sources
  - 11-60.1-113, Application Fees for Covered sources
  - 11-60.1-114, Annual Fees for Covered sources
  - 11-60.1-115, Basis of Annual Fees for Covered Sources
- Subchapter 8, Standards of Performance for Stationary Sources
  - 11-60.1-161, New Source Performance Standards
- Subchapter 9, Hazardous Air Pollutant Sources
- Subchapter 10, Field Citations

Standard of Performance for New Stationary Sources (NSPS), 40 CFR Part 60
Subpart I - Standards of Performance for Hot Mix Asphalt Facilities is applicable to the 225 TPH hot mix asphalt facility because the facility commenced construction or modification after June 11, 1973.

40 CFR Part 60 – NSPS, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines does not apply to the portable diesel engine generators because the units will be operated as nonroad engines. Nonroad engines are exempt from 40 CFR Part 60, Subpart IIII.

National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61
This source is not subject to NESHAPS as no hazardous air pollutants are emitted at significant levels and there are no NESHAPS requirements in 40 CFR Part 61.

40 CFR Part 63 – NESHAPS, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is not applicable to the diesel engine generators because the units are nonroad engines. Nonroad engines are exempt from 40 CFR Part 63, Subpart ZZZZ.

National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technology (MACT)), 40 CFR Part 63
There are no MACT requirements for this source.

Prevention of Significant Deterioration (PSD)
This source is not subject to PSD requirements because it is not a major stationary source as defined in 40 CFR 52.21 and HAR Title 11, Chapter 60.1, Subchapter 7.

Compliance Assurance Monitoring (CAM), 40 CFR 64
This source is not subject to CAM since the facility is not a major source. The purpose of CAM is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM.

Consolidated Emissions Reporting Rule (CERR)
This source is not subject to CERR since 40 CFR Part 51, Subpart A - Emissions Inventory Reporting Requirements, determines CERR based on facility wide emissions of each air pollutant at the CERR triggering levels. Emissions do not exceed respective CERR threshold levels.

DOH Annual Emissions Reporting
The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding the DOH reporting level(s) and for all covered sources. Internal annual emissions reporting will be required because this is a covered source.

Best Available Control Technology (BACT)
This source is not subject to BACT analysis because the potential to emit emissions are below significant levels. BACT analysis is required for new sources or modifications to sources that have the potential to emit or increase emissions above significant levels considering any limitations as defined in HAR, §11-60.1-1.

Synthetic Minor Source
A synthetic minor source is a facility that is potentially major as defined in HAR, §11-60.1-1, but is made non-major through federally enforceable permit conditions. This facility is a synthetic minor source because potential emissions do exceed major source thresholds (100 TPY) when the facility is operated at its (limit to 3000) maximum capacity continuously for 8,760 hours per year.

Greenhouse Gas Tailoring Rule
Title V permitting for greenhouse gas (GHG) emissions is not applicable because the potential to emit of CO_2 equivalent (CO_2e) emissions are less than 100,000 tons per year. Total GHG emissions on a CO_2e basis using the global warming potential (GWP) of the GHG are shown in the table below.

GHG	GWP	GHG Mass-Based Emissions (TPY)	CO_2e Based Emissions (TPY)
Carbon Dioxide (CO_2)	1	70	70
Methane (CH_4)	21	0	0
Nitrous Oxide (N_2O)	310	39	12090
Total Emissions:			12160

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

Hot Oil Heater
The 0.45 MMBtu/hour (7 gal/hr) hot oil heater, twin stack, is considered an insignificant activity for its primary fuel, ULSD, in accordance with HAR §11-60.1-82(f)(2) because the heat input capacity is less than one (1) MMBtu/hr. It is also considered an insignificant activity for its secondary fuel, LPG, in accordance with HAR §11-60.1-82(f)(3) because the heat input capacity is less than five (5) MMBtu/hr.

Storage Tanks
The following storage tanks are considered insignificant activities in accordance HAR §11-60.1-82(f)(1) because the capacities are less than 40,000 gallons each.

1. 1,500 gallon diesel fuel storage tank.

ALTERNATIVE OPERATING SCENERIOS

As an alternate operating scenario, the applicant will be allowed to replace the diesel engine generator with another diesel engine generator of similar or smaller size if replacement is required for the diesel engine generator. The alternative engine will be allowed as a replacement for period not to exceed twelve (12) consecutive months.

AIR POLLUTION CONTROLS

Baghouse
The drum mixer/dryer is equipped with a baghouse to control PM emissions.

Fuel Oil
ULSD (ultra low sulfur diesel, 15 ppm) is used for all equipment (primary fuel).
LPG, alternate fuel, can be used for the dryer/mixer drum and hot oil heater (secondary fuel)

PROJECT EMISSIONS

910 HP Diesel Engine
Emissions were based on Tier 1 emissions standards (engine date 19 Dec 99). The diesel engine will be fired on ULSD with a maximum sulfur content of 0.0015% by weight (15 ppm). Tier 1 Emission Standards > 750 HP

910 HP Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	17.05	25.58	74.69
NO_X	13.84	20.76	60.63
SO_2	0.01	0.01	0.04
PM	0.08	1.20	3.51
PM-10	0.77	1.16	3.37
PM-2.5	0.72	1.08	3.16
VOC	2.01	3.01	8.79
HAPs	0.021	0.032	0.093

225 TPH Drum Mixer
Emissions were based on the maximum capacity of the drum mixer, which is equipped with a baghouse to control PM emissions. The drum mixer will be fired on ULSD with a maximum sulfur content of 0.0015% by weight (15 ppm). Emission factors were taken from AP-42 Section 11.1 (3/04) - Hot Mix Asphalt Plants.

225 TPH Drum Mixer			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	29.25	43.88	128.12
NO_X	12.38	18.56	54.70
SO_2	0.11	0.16	0.46
PM	7.43	11.14	32.52
PM-10	5.18	7.76	22.67
PM-2.5	0.65	0.98	2.86
VOC	7.20	10.80	31.54
HAPs	1.98	2.97	8.68

HMA Silo Filling and Truck Load-Out Operations
Emissions for HMA silo filling and truck load-out operations were based on emission factors from AP-42 Section 11.1 (3/04) - Hot Mix Asphalt Plants.

HMA Silo Filling Operation		
Pollutant	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	0.40	1.16
PM	0.20	0.58
PM-10	0.20	0.58
PM-2.5	0.20	0.58
VOC	4.11	12.01
HAPs	0.06	0.18

HMA Truck Load-Out Operation		
Pollutant	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	0.46	1.33
PM	0.18	0.51
PM-10	0.18	0.51
PM-2.5	0.18	0.51
VOC	1.40	3.85
HAPs	0.03	0.09

Storage Piles
Emissions were based on the maximum capacity of the drum mixer. Emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) - Aggregate Handling and Storage Piles.

Storage Piles		
Pollutant	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	9.57	27.95
PM-10	4.53	13.22
PM-2.5	0.69	2.00

Aggregate Processing
Emissions due to conveyor transfer points were based on the maximum capacity of the drum mixer. Emissions were based on emission factors from AP-42 Section 11.19.2 (08/04) - Crushed Stone Processing and Pulverized Mineral Processing.

Aggregate Processing		
Pollutant	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	2.04	5.94
PM-10	0.75	2.18
PM-2.5	0.31	0.89

Hot Oil Heater (insignificant activity)
The hot oil heater is fired on fuel oil No. 2 with a maximum sulfur content of 0.5% by weight. The maximum fuel consumption is 7 gallons/hour. Emissions were based on emission factors from AP-42 Section 1.3 (9/98), Errata (4/00) - Fuel Oil Combustion.

Hot Oil Heater			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	0.02	0.02	0.07
NO_X	0.06	0.10	0.28
SO_2	0.00	0.00	0.00
PM	0.01	0.01	0.03
PM-10	0.00	0.01	0.02
PM-2.5	0.00	0.00	0.01
VOC	0.00	0.00	0.01
HAPs	0.00	0.000	0.001

Total Emissions
Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions (Limited)	Emissions (No Limits 8,760 hr/yr)	BACT Significant Level	CERR Triggering Level (Type A sources / Type B sources)	DOH Level
CO	70.3	205.4	100	2,500 / 1000	250
NO_X	39.4	115.1	40	2,500 / 100	25
SO_2	0.2	0.5	40	2,500 / 100	25
PM	24.3	71.0	25	-	25
PM-10	14.6	42.5	15	250 / 100	25
PM-2.5	3.4	10.0	-	250 / 100	-
VOC	19.2	56.2	40	250 / 100	25
HAPs	3.1	9.0	-	-	5

(Limited 3000 hours)

Modification emission change from increase in asphalt plant capacity from 160 TPH to 225 TPH for largest pollutants CO and NOx:
CO 70.3-57.4=12.9 TPY limited; 205.4-167.6=37.8 TPY unlimited
NOx 39.4-34.1=5.3 TPY limited; 115.1-99.5=15.6 TPY unlimited
Per 11-60.1-81, Chapter 5 Covered Sources, the increase in asphalt plant capacity from 160 TPH to 225 TPH is a significant modification as it does not quality as a minor modification even under limited operations (emission increase CO>5 TPY, other pollutants>2 TPY).

AIR QUALITY ASSESSMENT AERMOD

An ambient air quality impact assessment (AAQIA) was performed by the applicant for the proposed modification of the drum mixer/dryer, diesel engine generator, and hot oil heater to demonstrate compliance with State and National ambient air quality standards. The AERMOD model, ver. 12060, was used for the analysis to determine maximum pollutant impacts. The ozone limiting method (OLM) for NO_2 was used within AERMOD.

Terrain
A USGS 7.5 min digital elevation model (DEM) with ten (10) meter spacing from the Puu-O-Kali, Maui, Hawaii quadrangle was used to model the elevated terrain heights.

Meteorological data
The consultant used 2005 to 2009 meteorological data from CAB data base (5 year).
The consultant used 2005 to 2009 ozone data from CAB data base (5 year).

Receptor Grid
Receptor grid spacing was set at thirty (30) meters.

Dispersion Coefficient
Rural dispersion coefficient was selected.

Building Downwash
The EPA's Building Profile Input Program (BPIP) was used to evaluate downwash effects of nearby structures.

Emission Rates and Stack Parameters
The short term emission rates and stack parameters used in the analysis are shown in the table below. The emission rates were adjusted to account for the 3,000 hour/year equivalent limit when modeling annual impacts.

Source	**Emission Rates (g/s)**					**Stack Parameters**			
	CO	NO_X	PM-10	PM-2.5	SO_2	Height (m)	Diameter (m)	Flow Rate (m^3/s)	Temp (°K)
Drum Mixer/Dryer	3.68	1.55	0.65	0.08	0.013	9.84	1.14	21.7	422
Diesel Engine Generator	2.14	1.74	0.097	0.091	0.001	9.14	0.203	2.41	697
Hot Oil Heater (twin stack)	0.001	0.004	0.0002	0.00018	0.00004	4.57	0.165	0.034	450

Results

The annual concentrations assume annual fuel limits equivalent to 3,000 hours/year. The table below shows the predicted ambient air quality impacts from the baghouse servicing the drum mixer/dryer, diesel engine generator, and hot oil heater should comply with State and National ambient air quality standards

Predicted Ambient Air Quality Impacts							
Air Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	SAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Compared to SAAQS
CO	1-hr	228	1832	2060	10000	40000	20.6%
	8-hr	187	1145	1332	5000	10000	13.3%
NO2	1-hr[4]	53.6	26	79.6		100	79.6%
NO_2	Annual	22.7	5.6	28.3	70	100	40.4%
PM-10	24-hr	16.6	59	75.6	150	150	50.4%
	Annual	3.39	15.5	18.9	50	-	37.8%
PM-2.5	24-hr	8.87	11.8	20.7	-	35	53.1%
	Annual	2.03	4.3	6.3	-	15	42%
SO2	1-hr[4]	1.62	17	18.6		75	24.8%
SO_2	3-hr	4.75	31.4	36.2	1300	1300	2.7%
	24-hr	3.18	10.5	13.7	365	365	3.7%
	Annual	0.58	2.6	3.2	80	80	4%

notes:

1. EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour concentrations are used, respectively. State of Hawaii scaling factor of 0.2 is used for annual concentrations.

2. Background concentrations from 2009 Hawaii Air Quality Data. Maximum background concentrations for CO, NO_2, SO_2 and PM taken from Kapolei, Oahu (2009-2010).
   PM-2.5 98th percentile used.

3. Assume total conversion of NO_X to NO_2.

4. 1-hr NO_2 and SO_2 values in PPB.

SIGNIFICANT PERMIT CONDITIONS

1. The 225 TPH Portable Drum Mix Asphalt Plant is subject to the provisions of 40 CFR Part 60, Subpart A and Subpart I.

2. The 910 bhp diesel engine generator <u>is not</u> subject to the provisions of 40 CFR Part 60, Subpart A and Subpart IIII.

3. Drum Mixer/Dryer

   a. The drum mixer/dryer shall be fired only on the following fuels:

      i. Fuel oil no. 2 (ULSD) with a maximum sulfur content not to exceed fifteen (15) ppm by weight;
      ii. LPG.

b. The total operating hours of the drum mixer shall not exceed 3,000 hours in any rolling twelve-month (12-month) period.
c. The permittee shall not discharge or cause the discharge into the atmosphere from the baghouse servicing the drum mixer/dryer, particulate matter in excess of ninety (90) mg/dscm (0.04 gr/dscf).

4. Diesel Engine Generator

   a. The diesel engine generator shall be fired only on the following fuels (for SOx control):

      i. Fuel oil no. 2 (ULSD) with a maximum sulfur content not to exceed fifteen (15) ppm by weight, and

   b. The total operating hours of the drum mixer shall not exceed 3,000 hours in any rolling twelve-month (12-month) period.

5. Baghouse

   The baghouse pressure differential shall be maintained within the range of two (2) to six (6) inches of water.

CONCLUSION

Actual emissions should be less than those estimated. Emission calculations were based on the maximum capacities of the equipment. The ambient air quality assessment demonstrates compliance with State and National Ambient Air Quality Standards.

Based on the information submitted by Maui Asphalt X-IV, LLC it is the determination of the Department of Health that the proposed modification project will be in compliance with the Hawaii Administrative Rules, Chapter 11-60.1, and State and National ambient air quality standards. Recommend issuance of the temporary covered source permit subject to the incorporation of the significant permit conditions, thirty-day (30-day) public comment period, and forty-five-day (45-day) Environmental Protection Agency review period.

Gary Siu
February 2013